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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>23 March 2007</u>.

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-27</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>03/23/2007</u> is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>1/29/2007</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Amendment filed on 03/23/2007 has been acknowledged.

Response to Arguments

1.   Applicant's arguments with respect to Claims 1-27 have been considered but are

moot in view of the new ground(s) of rejection. Applicant has amended the claims with

new limitation such as "automatic". Such new limitation necessitates new search and

consideration. Therefore, Applicant's arguments are moot in view of new grounds of

rejection and this action is final.

Drawing

2.   The drawings are objected to because In Figure 3, there should be an arrow

connecting 26 to 27, Algorithm Parameters to Image Enhancement Algorithm.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to

the Office action to avoid abandonment of the application. Any amended replacement

drawing sheet should include all of the figures appearing on the immediate prior version

of the sheet, even if only one figure is being amended. The figure or figure number of an

amended drawing should not be labeled as "amended." If a drawing figure is to be

canceled, the appropriate figure must be removed from the replacement sheet, and

where necessary, the remaining figures must be renumbered and appropriate changes

made to the brief description of the several views of the drawings for consistency.

Additional replacement sheets may be necessary to show the renumbering of the

remaining figures. Each drawing sheet submitted after the filing date of an application

must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   **Claims 1-4, 6-19 and 21-27** are rejected under 35 U.S.C. 102(b) as being

anticipated by Gruzdev (PGPUB-DOCUMENT-NUMBER: 20030002095).

() Regarding Claim 1:

A method for applying an automatic image enhancement algorithm to input

digital images represented in different input color spaces comprising:

(Changing the name of the algorithm to *"an automatic image enhancement algorithm"*

does not make the image enhancement automatic.

Gruzdev's invention is like a Photoshop. Operator indicates what needs to change in

the original image and the invention automatically changes it. [0043] "As a result, when

the operator specifies...")

a) identifying the input color space of an input digital image;

([0020] on Page 3, "taking an image with colors represented within a color system or

color space; defining a color or range of colors in an image that is to be modified.")

b) applying a color space transformation to the input digital image represented in the input color space to form a corresponding input digital image in a reference color space;

(Steps a and b can be done manually. It does not say, "automatically identifying..." or "automatically applying...". In Fig. 3, 24 and 22 are not connected; meaning a user needs to choose the correct formulas for transformation to reference color space.

[0020] "converting a representation of this color to a color space."

[0042] "convert the target replacement color specification into a reference color space.")

c) adjusting one or more algorithm parameters of the automatic image enhancement algorithm

(Changing the name of the algorithm to "an automatic image enhancement algorithm" does not make the image enhancement automatic or the adjustment of algorithm parameters automatic. It does not say, "automatically adjusting..." Step c can be done manually.

[0020] "The look-up table is constructed...". Once the look-up table is constructed, operator indicates what needs to change in the original image and the invention automatically changes it.)

in response to the identified input color space; and

([0016] "...a system for modifying a specific color or range of colors in an image by providing a choice of pre-arranged and named replacement colors selectable from a palette, look-up table, or the like."

[0020] "The look-up table is constructed, for example, from the color channel components of the original source color and the replacement color along with the lowest and highest values which can be represented in a color channel and the look-up table's construction is subject to certain rules, whereby one or other end of the look-up table function may be moved outside the range of representable values for a channel when the source color is within a certain threshold of the limits of this range." The look-up table will different when enhancing sRGB image as opposed to Adobe Wide Gamut RGB image. Thus image enhancement using a look-up table is in response to the identified input color space.

[0020] "permitting a definition of hue, lightness and saturation (or their equivalents) if the current color space does not permit this." This is in response to identified input color space.)

   d) applying the automatic image enhancement algorithm with the one or more adjusted algorithm parameters to the corresponding input digital image in the reference color space to produce an enhanced digital image in the reference color space.

(Part d does not specify, "automatically applying"; so it includes manually applying. Gruzdev's invention can be implemented like a Photoshop. The operator specifies what needs to change and his algorithm automatically changes them, [0043] "As a result,

when the operator specifies that saturation should remain unchanged when applying the

target color to a neutral achromatic source color, he or she is confused that no visible

difference in the image occurs. In such a situation allowing a small change in the

saturation even though formally saturation should remain unchanged results in a slight

visual change of the image and eliminates the operators confusion." This small change

is automatic.

[0020] "replacing the hue and, optionally the saturation or lightness or both of this color

with a hue (and as desired, the saturation and lightness) selected from a specified

target color to form a replacement color.")

() Regarding Claim 2:

The method according to claim 1 wherein the reference color space is an

extended color gamut color space.

([0042] "every color in the original image may be converted to the reference color

space.")

() Regarding Claim 3:

The method according to claim 1 wherein the input color space is a limited color

gamut color space.

([0020] "taking an image with colors represented within a color system or color space,

for instance, in the RGB color space; defining a color or range of colors in an image that

is to be modified;")

() Regarding Claim 4:

The method according to claim 1 wherein the reference color space represents

an estimate of the colors in an original scene.

([0041] "A fourth method of defining the target replacement color is to select it from

another image." "A fifth method of defining the target replacement color is to select it

from the image being modified."

[0042] "convert the target replacement color specification into a reference color space.")

() Regarding Claim 6:

The method according to claim 4 wherein the input color space is a video RGB color

space,

(Video RGB is inherent. [0020] "taking an image with colors represented within a color

system or color space, for instance, in the RGB color space; defining a color or range of

colors in an image that is to be modified;")

and wherein the color space transformation is substantially an inverse of a

color adjustment function used to map original scene colors to corresponding colors

appropriate for display on a video display.

([0020] "converting a representation of this color to a color space."

"a look-up table in the original color space to convert the specific colors of the image.")

() Regarding Claim 7:

The method according to claim 6 wherein the inverse color adjustment function produces corresponding input digital images in the reference color space having reduced highlight color saturation for highlight color values compared with corresponding original scene colors.

([0020] "replacing the hue and, optionally the saturation or lightness or both of this color with a hue (and as desired, the saturation and lightness) selected from a specified target color to form a replacement color; converting the replacement color (as measured in the second color space format, e.g., hue, saturation and lightness) to the original color space format.")

() Regarding Claim 8:

The method according to claim 1 further including the step of applying an output color space transformation to the output digital image in the reference color space to form a corresponding output digital image in an output color space.

([0020] "converting the replacement color (as measured in the second color space format, e.g., hue, saturation and lightness) to the original color space format.")

() Regarding Claim 9:

The method according to claim 8 wherein the output color space is the same as the input color space.

([0020] "converting the replacement color (as measured in the second color space format, e.g., hue, saturation and lightness) to the original color space format.")

() **Regarding Claim 10:**

10. (Currently amended) The method according to claim 1 wherein the automatic image enhancement algorithm is an adaptive tone scale enhancement algorithm.

(ABSTRACT: The color correction device may include a means for creating a tone reproduction curve based on conceptually moving one or other limit of a range of image color values in order to provide a tone reproduction curve with improved rendering of the color correction.

[0021] "FIG. 1 shows a series of tone reproduction curves before and after adjustment"

[0037] "A method is used to provide a tone reproduction curve..."

[0038] "...the program creates a monotonic tone reproduction curve..."

[0039] "The monotonic tone reproduction curve..."

Once the curve is set, tone enhancement is automatic.)

() **Regarding Claim 11:**

11. (Currently amended) The method according to claim 1 wherein the automatic image enhancement algorithm is a color enhancement algorithm.

(ABSTRACT: "color correction device... improved rendering of the color."

[0011] "a means of correcting a specific color or specific range of colors in an

image."[0011]-[0014].

Color is enhanced automatically, as in Photoshop. This is described further in Claim 1.)

() **Regarding Claim 12:**

12. *(Currently amended) The method according to claim 1 wherein the*

automatic image enhancement algorithm is a noise reduction algorithm.

([0040] "this reduces the effect of image noise on the definition of the source color."

[0014] modifying specific dark or light colors, or specific ranges of such colors in an

image without introducing unpleasant artifacts in the remaining colors of the image or

loss of image detail.

Noise reduction is automatic, as in Photoshop.)

() **Regarding Claim 13:**

13. *(Currently amended) The method according to claim 1 wherein the*

automatic image enhancement algorithm is a sharpening algorithm.

(Sharpening is inherent. ABSTRACT: "improved rendering of the color correction."

[0004] "range of colors is rendered correctly."

[0011] "correcting a specific color or specific range of colors in an image wherein

remaining colors (e.g., colors and/or ranges of colors outside the scope of the specific

color and/or specific range selected) are modified to a degree smaller than the change

in the color or color range being corrected."

[0014] "modifying specific dark or light colors, or specific ranges of such colors in an

image without introducing unpleasant artifacts in the remaining colors of the image or

loss of image detail.")

() **Regarding Claim 14:**

14. (Currently amended) The method according to claim 1 wherein a sequence of

automatic image enhancement algorithms are applied to the corresponding input

digital image in the reference color space.

([0020] "permitting a definition of hue, lightness and saturation (or their equivalents) if

the current color space does not permit this; computing the hue, saturation and

lightness of the color in this color space; replacing the hue and, optionally the saturation

or lightness or both of this color with a hue (and as desired, the saturation and

lightness) selected from a specified target color to form a replacement color; converting

the replacement color (as measured in the second color space format, e.g., hue,

saturation and lightness.")

() **Regarding Claim 15:**

15. (Currently amended) The method according to claim 1 wherein the one or

more algorithm parameters control whether or not a component of the automatic

image enhancement algorithm is applied.

([0011] "a means of correcting a specific color or specific range of colors in an image."

[0018] "system for modifying a specific color or specific range of colors in an image by providing the operator with a means to prepare and retain a set of replacement colors.")

() **Regarding Claim 16**:

(Currently amended) A method for applying an automatic image enhancement algorithm to input digital images represented in different input color spaces comprising: (Changing the name of the algorithm to *"an automatic image enhancement algorithm"* does not make the image enhancement automatic. Gruzdev's invention is like a Photoshop. Operator indicates what needs to change in the original image and the invention automatically changes it. . [0043] "As a result, when the operator specifies...")

a) identifying the input color space of an input digital image;
([0020] on Page 3, "taking an image with colors represented within a color system or color space; defining a color or range of colors in an image that is to be modified.")

b) applying a color space transformation to the input digital image represented in the input color space to form a corresponding input digital image in a reference color space;

(Steps a and b can be done manually. It does not say, "automatically identifying..." or

"automatically applying...". In Fig. 3, 24 and 22 are not connected; meaning a user

needs to choose the correct formulas for transformation to reference color space.

[0020] "converting a representation of this color to a color space."

[0042] "convert the target replacement color specification into a reference color space.")

    c) selecting a version of the automatic image enhancement algorithm

(Changing the name of the algorithm to "an automatic image enhancement algorithm"

does not make the image enhancement automatic or the version selection automatic. It

does not say, "automatically adjusting..." Step c can be done manually.

[0020] "The look-up table is constructed...". Once the look-up table is constructed,

operator indicates what needs to change in the original image and the invention

automatically changes it.)

    according to the identified input color space; and

([0016] "...a system for modifying a specific color or range of colors in an image by

providing a choice of pre-arranged and named replacement colors selectable from a

palette, look-up table, or the like."

[0020] "The look-up table is constructed, for example, from the color channel

components of the original source color and the replacement color along with the lowest

and highest values which can be represented in a color channel and the look-up table's

construction is subject to certain rules, whereby one or other end of the look-up table function may be moved outside the range of representable values for a channel when the source color is within a certain threshold of the limits of this range."

The look-up table will different when enhancing sRGB image as opposed to Adobe Wide Gamut RGB image. Thus image enhancement using a look-up table is in response to the identified input color space.

[0020]."...permitting a definition of hue, lightness and saturation (or their equivalents) if the current color space does not permit this...replacing the hue and, optionally the saturation or lightness or both." This is in response to identified input color space.)

d) applying the selected version of the automatic image enhancement algorithm to the corresponding input digital image in the reference color space to produce an enhanced digital image in the reference color space

(Part d does not specify, "automatically applying"; so it includes manually applying. Gruzdev's invention can be implemented like a Photoshop. The operator specifies what needs to change and his algorithm automatically changes them, [0043] "As a result, when the operator specifies that saturation should remain unchanged when applying the target color to a neutral achromatic source color, he or she is confused that no visible difference in the image occurs. In such a situation allowing a small change in the saturation..." This small change is automatic.

[0020] "replacing the hue and, optionally the saturation or lightness or both of this color with a hue (and as desired, the saturation and lightness) selected from a specified target color to form a replacement color.")

() **Regarding Claim 17**:

The method according to claim 16 where the reference color space is an extended color gamut color space.

([0042] "every color in the original image may be converted to the reference color space.")

() **Regarding Claim 18**:

The method according to claim 16 where the input color space is a limited color gamut color space.

([0020] "taking an image with colors represented within a color system or color space, for instance, in the RGB color space; defining a color or range of colors in an image that is to be modified;")

() **Regarding Claim 19**:

The method according to claim 16 where the reference color space represents an estimate of the colors in an original scene.

([0041] "A fourth method of defining the target replacement color is to select it from another image." "A fifth method of defining the target replacement color is to select it from the image being modified."

[0042] "convert the target replacement color specification into a reference color space.")

() **Regarding Claim 21**:

The method according to claim 19 where the input color space is a video RGB color space,

(Video RGB is inherent. [0020] "taking an image with colors represented within a color system or color space, for instance, in the RGB color space; defining a color or range of colors in an image that is to be modified;")

and wherein the color space transformation is substantially an inverse of a color adjustment function used to map original scene colors to corresponding colors appropriate for display on a video display.

([0020] "converting a representation of this color to a color space."

"a look-up table in the original color space to convert the specific colors of the image.")

() **Regarding Claim 22**:

The method according to claim 21 where the inverse color adjustment function produces corresponding input digital images in the reference color space having reduced highlight color saturation for highlight color values compared with corresponding original scene colors.

([0020] "replacing the hue and, optionally the saturation or lightness or both of this color with a hue (and as desired, the saturation and lightness) selected from a specified target color to form a replacement color; converting the replacement color (as measured

in the second color space format, e.g., hue, saturation and lightness) to the original

color space format.")

() **Regarding Claim 23**:

23. (Original) The method according to claim 16 further including the step of

applying an output color space transformation to the output digital image in the

reference color space to form a corresponding output digital image in an output color

space.

([0020] "converting the replacement color (as measured in the second color space

format, e.g., hue, saturation and lightness) to the original color space format.")

() **Regarding Claim 24**:

24. (Currently amended) The method according to claim 16 wherein the selected

version of the automatic image enhancement algorithm is an adaptive tone scale

enhancement algorithm.

(ABSTRACT: The color correction device may include a means for creating a tone

reproduction curve based on conceptually moving one or other limit of a range of image

color values in order to provide a tone reproduction curve with improved rendering of

the color correction.

[0021] "FIG. 1 shows a series of tone reproduction curves before and after adjustment")

() **Regarding Claim 25**:

25. *(Currently amended) The method according to claim 16 wherein the selected version of the automatic image enhancement algorithm is a color enhancement algorithm.*

(ABSTRACT: "color correction device... improved rendering of the color."

[0011] "a means of correcting a specific color or specific range of colors in an image."

[0011]-[0014].)

() **Regarding Claim 26**:

26. *(Currently amended) The method according to claim 16 wherein the selected version of the automatic image enhancement algorithm is a noise reduction algorithm.*

([0040] "this reduces the effect of image noise on the definition of the source color."

[0014] modifying specific dark or light colors, or specific ranges of such colors in an image without introducing unpleasant artifacts in the remaining colors of the image or loss of image detail.)

() **Regarding Claim 27**:

27. *(Currently amended) The method according to claim 16 wherein the selected version of the automatic image enhancement algorithm is a sharpening algorithm.*

(Sharpening is inherent. ABSTRACT: "improved rendering of the color correction."

[0004] "range of colors is rendered correctly."

[0011] "correcting a specific color or specific range of colors in an image wherein remaining colors (e.g., colors and/or ranges of colors outside the scope of the specific

color and/or specific range selected) are modified to a degree smaller than the change

in the color or color range being corrected."

[0014] "modifying specific dark or light colors, or specific ranges of such colors in an

image without introducing unpleasant artifacts in the remaining colors of the image or

loss of image detail.")

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
>
> set forth in section 102 of this title, if the differences between the subject matter sought to be patented
>
> and the prior art are such that the subject matter as a whole would have been obvious at the time the
>
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
>
> Patentability shall not be negatived by the manner in which the invention was made.

6.   **Claims 5 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Gruzdev (PGPUB-DOCUMENT-NUMBER: 20030002095) in view of Capitant (US-

PAT-NO: 5321500).

Gruzdev discloses *input color space represents the colors of a photographic negative.*

([0020] on Page 3, "taking an image with colors represented within a color system or

color space; defining a color or range of colors in an image that is to be modified.")

Gruzdev also discloses, [0020] "constructing a look-up table in the original color space

to convert the specific colors of the image". However, Gruzdev does not disclose: the color space transformation is an inverse film sensitometry transformation.

Capitant discloses color space transformation is an inverse film sensitometry transformation. (Column 7, lines 50-55, "film transform section includes logarithm look-up tables 90, 92, and 94, masking matrix 96, parameter registers 112, and reverse sensitometry and linearizing look-up tables 98, 101, and 103." Column 8, line 23-25, "reverse sensitometry.")

As Capitant says in Column 7, lines 36-45, and shows in Figure 6, it may be desirable to "perform a limited type of color transformation, namely the transformation of the colors of the digitized images generated by camera processor 12 (as a result of scanning motion picture film) into colors that would have been generated if the subject had been imaged directly by a video camera (i.e., without intermediate filming and film scanning steps)." Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the method of Capitant, which involves reverse sensitometry, into Gruzdev's method, to digitally color correct the digitized images from motion picture film (Capitant's column 1, "FIELD OF THE INVENTION"). Capitant's look up tables can be incorporated into Gruzdev's look up tables.

Conclusion

7.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

8.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Benz (US 20020067518 A1) discloses, "Process and apparatus

for the manufacture of a digital color picture."

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Max Shikhman whose telephone number is (571) 270-

1669. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Max Shikhman

1/29/2007

SHUWANG LIU
SUPERVISORY PATENT EXAMINER